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AUTHOR Rogers, James R.; Alexander, Ralph A.
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ABSTRACT

This study was conducted to examine whether changes in self-concept would occur as the result of participation in a 7-week running program. It was hypothesized that participation in a running program would have a significant, positive effect on global self-concept and more specifically, its components of self-efficacy and perceptions of the physical self. Subjects included 51 university students who completed the Tennessee Self-Concept Scale, the Self Efficacy Scale, a perceived level of physical fitness scale, and a task specific self-efficacy scale before and after participating in the 7-week running program. The results revealed significant experimental group gains from the pre- to the post-test, suggesting the utility of running as a self-concept enhancing activity. Furthermore, the use of perceptions of physical fitness and self-efficacy as dependent variables in assessing the effects of exercise on self-concept is indicated. (NB)

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# The Effects of Running on Self-Concept and Self-Efficacy

James R. Rogers

Ralph A. Alexander

The University of Akron

Running Head: Running and Self-Concept

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## ABSTRACT

Comparisons of the seven-week pre-post test scores of 51 college students on selected subscales of the Tennessee Self-Concept Scale, the Self Efficacy Scale, a perceived level of physical fitness scale, and a task specific self-efficacy scale were made to determine the effects of a running program on self-perceptions. Analyses revealed significant experimental group gains indicating the utility of running as a self-concept enhancing activity. Correlations among the dependent variables were analyzed in an attempt to better understand these effects.

# The Effects of Running on Self-Concept and Self-Efficacy

While the necessity of maintaining both the physical and psychological health of the human organism seems apparent, not so obvious is the relationship between these two systems. Although somatopsychic theory posits a framework for explaining this relationship, the question of how changes in physical fitness affect psychological variables remains largely unanswered (Folkins & Sime, 1981). One focus of interest in this area has centered around the effects of physical fitness on personality.

Reviewing the literature on physical fitness training and mental health, Folkins and Sime (1981), found no evidence to support claims of global personality change due to changes in physical fitness and recommended that research be aimed at more well defined variables. They concluded that, while significant changes in global personality as a result of training were not evident, the reviewed research "...has generally confirmed the assumption that fitness training improves self-concept." More recently, Doan and Scherman (1987) suggested that, just as global personality as a dependent variable encompasses too broad a category for research in this area, equally problematic is research investigating the effects of physical fitness on global self-

concept. In their review of the literature regarding the therapeutic effects of fitness on personality, they reiterated Folkins and Sime's recommendation by noting that the literature primarily confronts global personality and global self-concept variables and stated that "...care should be taken that the dependent measures used are appropriate for the task."

Employing the "self as object" definition of the self, the present investigation began with the goal of determining the most salient aspects of self-concept to be used as dependent variables when investigating the relationship between physical fitness and self-concept. For this purpose, self-concept was viewed as the gestalt of all possible self-referent terms.

Leanordson and Gargiulo (1978) administered a self-rating scale of perceived physical fitness to 15 college students before and after a 10 week jogging class. Although no significant differences in global self-concept were found, the positive increases they did observe were concluded to be attributed to perceptions of improved fitness rather than actual physiological changes.

Brown, Morrow and Livingston (1982) compared changes in several aspects of self-concept in college women over the course of a physical conditioning program. They concluded that while the program did lead to changes in some aspects of self-concept the changes were somewhat selective. In

particular though, improvement seemed to be greatest in perceptions of the physical self. They further suggested that dependent measures used to assess the self-concept/physical fitness relationship should be directly associated with the significant event (i.e. exercise).

Ismail and Trachtman (1973), using a four-month core program of progressive, supervised running, found that low-fitness subjects experienced large increases in self-sufficiency as compared to high-fitness subjects. The authors suggested that the direct physical effects of conditioning and the psychological effects of mastery and self-efficacy both contributed to increased perceptions of self-sufficiency.

The Brown et al (1982) findings coupled with those of Ismail and Trachtman (1973) and Leanordson and Gargiulo (1978), suggest that a focus on perceptions of physical fitness and the extensive work on self-efficacy might profitably be brought to this area of research. Efficacy as a self-referent term denotes the perception of one's effectiveness in interacting with the environment. Perceptions of self-efficacy can be specific to a certain task (i.e. task-specific self-efficacy) or a more global perception of general self-efficacy. In a comprehensive series of studies, Bandura (1977, 1982) has shown that enactive mastery produces the most generalized increases in coping efficacy which in turn leads to strong precepts of self-efficacy.

These conclusions would seem to indicate that success in a physical training program (i.e. enactive mastery) would increase self-perceptions of efficacy which in turn would lead to enhanced self-concept.

In summation, the present review has identified perceptions of physical fitness and perceptions of self-efficacy (especially those perceptions specifically related to the physical task) as salient dependent variables for inquires into the effects of physical fitness on self-concept. The purpose of the present investigation, then, was to determine if changes in self-concept would occur as the result of participation in a seven-week running program. It was hypothesized that participation in a running program would have a significant, positive effect on global self-concept and more specifically, its components of self-efficacy and perceptions the physical-self. Secondly, it was hypothesized that global self-concept, self-efficacy, and perceptions of the physical-self would be positively correlated with the subjective perception of level of physical fitness. Lastly, it was hypothesized that there would be a significant, positive correlation between the self-efficacy measures and self-concept measures indicating the usefulness of self-efficacy as a gauge of change in global self-concept.

## Method

### Subjects

Fifty-one university students age 18 to 43 ($M_N$ = 23), served as voluntary participants in the study. Sixteen students (5 males, 11 females) were recruited from university running classes and 38 control subjects were recruited from outside of the running classes. Three volunteers from the control group were excluded because of increases in their aerobic activity level from pre to post test. Data from the remaining 35 control subjects (16 males, 19 females) were used in the final analyses. Experimental subjects were recruited in classroom settings with instructor permission. Control subjects were recruited from the general student population outside of the classrooms. There was no compensation given for participation in the study.

### Materials

Three assessment measures were used in the study: the Tennessee Self-Concept Scale (TSCS, counseling form, Fitts 1965); the Self Efficacy Scale (SES, Tipton and Worthington, 1984) and a questionnaire designed specifically for the study.

The TSCS is a 100-item questionnaire with a five-point scale response format ranging from completely false to completely true. The TSCS was used to assess the self-concept of the subjects because it has been shown to reliably measure aspects of the self. The total positive (general self-

concept) score reflects the subject's overall level of self-esteem, self-worth, and self-confidence. The Column A (physical-self) score assesses an individual's view of "his body, his state of health, his physical appearance, skills and sexuality" (Fitts, 1965, p. 3). Test retest reliabilities are reported to be .87 and .92 respectively for the two scales.

The SES is an instrument developed to assess generalized self-efficacy. It consists of ten items responded to on a seven-point Likert scale ranging from strongly agree to strongly disagree. The SES items were generated from the "Faith in Self" factor of a measurement of the concept of faith (Tipton, Harrison, & Mahoney, 1980).

A questionnaire was used to gather some general information about the subjects regarding their age, sex, academic major, and aerobic activity level. An attempt to measure the subject's perceived level of physical fitness was made via a seven-point rating scale using "good physical condition" and "poor physical" condition as anchors. The last portion of the questionnaire was a measure of task-specific self-efficacy (TSSE). Based on Bandura's (1977) work, TSSE is a measure of both the magnitude and strength of efficacy expectations regarding a specific task. Magnitude is a measure of efficacy based on a hierarchy of task difficulty while strength is a measure of the degree of certainty of the respondent that the individual tasks in the hierarchy can be

accomplished (Table 1 contains the TSSE measure used in this study).

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Insert Table 1 about here

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Procedure

Testing occurred in two time periods seven weeks apart. The first testing was during the beginning two weeks of the semester, and the second was seven weeks later. The TSCS, SES, and the questionnaire test packets were counterbalanced and given to the subjects at each testing interval. A cover letter attached to the front of the test packet explained the requirements for participation in the project, provided an example of the nature of the questions to be asked, and explained confidentiality and freedom to withdraw participation. Administration instructions were scripted to insure consistency. The instructions included a brief description of the purpose of the study, a request for adherence to the instructions presented in the TSCS manual and the SES, and a request for response accuracy. The running classes met twice a week for 50 minutes and consisted of a warm-up and cool-down period along with a combination of exercise and classroom instruction. The exercise portion of the classes consisted of a minimum of 30 minutes of running or a combination of walking and running. In addition to the 60

minutes of running during class time, students were required to run at least three additional days for 30 minutes each. Total exercise time then was two and one half hours per week. Debriefing at the end of the posttest evaluation consisted of a restatement of the purpose of the study and an acknowledgment of appreciation for participation.

## Results and Discussion

Descriptive statistics for the five dependent variables of interest are presented in Table 2. Analysis of variance on the pre-test scores showed that there were no statistically significant differences between the running group and control group on any of the five dependent variables of interest.

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Insert Table 2 about here

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In order to test the primary hypothesis, analysis of covariance was performed on each of the post-test measures, using its own pre-test as the covariate. In all cases, the post-test means (pre-test-corrected) for the running group were significantly higher than for the control group: TSCS - general self-concept ($F(1,49) = 6.70$, $p<.05$), TSCS - physical self ($F(1,49) = 5.78$, $p<.05$), SES-general self-efficacy ($F(1,49) = 4.31$, $p<.05$), perceived level of physical fitness ($F(1,49) = 4.59$, $p<.05$), and task specific self-efficacy ($F(1,49) = 8.86$, $p<.01$).

Pearson product-moment correlations between the dependent variables based on the pre-test scores of the total sample (N=51) were used to investigate the hypothesis that global self-concept, self-efficacy, and physical self will be positively correlated with the perceived level of physical fitness. Those correlations are presented in Table 3.

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Insert Table 3 about here

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As expected, the correlations between the perceived level of physical fitness and the remaining dependent variables indicate its value as a self-concept measure. Furthermore, the strongest correlations, .64 with TSCS - physical-self and .54 with task- specific self-efficacy, suggest that perceived level of fitness, while measuring an aspect related to these two variables, would seem to be providing information about the person's self- perception over-an-above that from the physical self and efficacy measure. When separated by group, the correlations between perceived level of physical fitness and general self-concept were .68 ($p < .01$) at pretest and .72 ($p < .01$) at post-test. However, these same correlations for the control group were nonsignificant with .27 ($p > .05$) for the pretest and .09 ($p > .05$) for the post-test. These correlations strongly differentiated the two groups.

The SES general self-efficacy scale and the task-specific self-efficacy scale correlate .35 and .27 with the TSCS - general self-efficacy and .50 and .42 with the TSCS - physical self respectively (all $p < .05$). These correlations indicate their usefulness as measures of efficacy information and as components of self-concept. An explanation for these relatively lower correlations between self-concept and self-efficacy may be that the TSCS is measuring a passive self-evaluation while the SES and task-specific self-efficacy are measuring an active component. This difference is evident in the statements "This is what I am." versus "This is what I am capable of doing."' both of which are components of self-concept. The correlation between task-specific self-efficacy and the SES (.56, $p < .001$) also indicates the value of the SES as a self-efficacy instrument and lends support to Bandura's (1977) theory of generalization as a dimension of self-efficacy.

## Conclusion

The results of this study demonstrate the utility of running as a self-concept enhancing activity which could be incorporated into a therapeutic situation. In addition, the use of perceptions of physical fitness and self-efficacy as dependent variables in assessing the effects of exercise on self-concept is indicated. The existence of a significant correlation between the perceived level of physical fitness

and general self-concept for the running group and a non-significant correlation for the control group suggest that the application as therapy may be relevant only when a subjective concern for physical fitness is already present. Further investigation is needed to determine if this correlation could be used to differentiate those individuals who would benefit from this type of therapeutic intervention from those who would not. Also, research that would overcome the self-selection bias present in this study would undoubtedly provide a clearer view of the effects of running on self-concept and self-efficacy.

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Table 1
Task Specific Self-Efficacy Measures (TSSE).

Being as accurate as possible, respond to the following statements in two ways:

a) Yes or no as to whether or not you feel you can actually accomplish the task.
b) The degree of certainty, from 0 to 100, that you feel about your first response.

| | | Column A Yes/No | Column B Certainty 0 to 100% |
|---|---|---|---|
| 1) | I can run 1/8th of a mile | _____ | _____ |
| 2) | I can run 1/4th of a mile | _____ | _____ |
| 3) | I can run 1/2 of a mile | _____ | _____ |
| 4) | I can run 1 mile | _____ | _____ |
| 5) | I can run 3 miles | _____ | _____ |
| 6) | I can run 5 miles | _____ | _____ |
| 7) | I can run 7 miles | _____ | _____ |
| 8) | I can run 10 miles | _____ | _____ |

Table 2
Means and standard deviations of the dependent variables

| | PRE TEST | | POST TEST | |
|---|---|---|---|---|
| | RUNNERS n = 16 | CONTROLS n = 35 | RUNNERS n = 16 | CONTROLS n = 35 |
| TSCS: GENERAL SELF-CONCEPT | X=342.44 SD=33.9 | X=342.14 SD=30.2 | X=360.31 SD=35.0 | X=344.94 SD=32.2 |
| TSCS: PHYSICAL SELF | X=69.25 SD=10.8 | X=67.17 SD=7.8 | X=74.50 SD=9.5 | X=68.71 SD=8.2 |
| SES: GENERAL SELF-EFFICACY | X=53.69 SD=7.0 | X=49.66 SD=6.7 | X= 56.69 SD=7.4 | X=49.97 SD=7.7 |
| PERCEIVED LEVEL OF PHYSICAL FITNESS | X=4.63 SD=1.9 | X=4.80 SD=1.1 | X=5.50 SD=2.0 | X=5.14 SD=1.0 |
| TASK SPECIFIC SELF-EFFICACY | X=72.25 SD=31.2 | X=65.57 SD=26.8 | X=83.44 SD=30.5 | X=67.60 SD=25.0 |

Table 3
Pre-test Intercorrelations of the Dependent Variables for the Total sample (n=51).

| | TSCS: General Self-Concept | TSCS: Physical Self | SES: General Self-Efficacy | Perceived Level of Physical Fitness |
|---|---|---|---|---|
| TSCS: Physical Self | .81*** | | | |
| SES: General Self-Efficacy | .35** | .50*** | | |
| Perceived Level of Physical Fitness | .45*** | .64*** | .46*** | |
| Task Specific Self-Efficacy | .27* | .42*** | .56*** | .54*** |

*p<.05
**p<.01
***p<.001